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10/825,757	04/16/2004	Jeffrey M. Linnen	GP146-04.UT	8545

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EXAMINER	
SALMON, KATHERINE D	

ART UNIT	PAPER NUMBER
1634	

NOTIFICATION DATE	DELIVERY MODE
01/08/2009	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/825,757	LINNEN ET AL.	
	Examiner	Art Unit	
	KATHERINE SALMON	1634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 October 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *116,124-131 and 139-144* is/are pending in the application.

4a) Of the above claim(s) *131 and 139-144* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *116, 124-130* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This action is in response to papers filed 10/20/2008.

2. Claims 116, 124-131. and 139-144 are pending. Claims 1-115, 117-123, 132-138, and 145-183 have been cancelled.

3. Claims 131 and 139-144 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 10/26/2006.

4. This action contains rejections for Claims 116 and 124-130. Response to arguments follows.

5. This action is FINAL.

Priority

6. Applicant's claim for the benefit of a prior-filed application under 35 U.S.C. 119(e) or under 35 U.S.C. 120, 121, or 365(c) is acknowledged. Applicant has not complied with one or more conditions for receiving the benefit of an earlier filing date under 35 U.S.C. 119(e) as follows:

The later-filed application must be an application for a patent for an invention which is also disclosed in the prior application (the parent or original nonprovisional application or provisional application). The disclosure of the invention in the parent application and in the later-filed application must be sufficient to comply with the

requirements of the first paragraph of 35 U.S.C. 112. See *Transco Products, Inc. v. Performance Contracting, Inc.*, 38 F.3d 551, 32 USPQ2d 1077 (Fed. Cir. 1994). The disclosure of the prior-filed applications, Application No. 60/469294, 60/465428, 60/464049, fail to provide adequate support or enablement in the manner provided by the first paragraph of 35 U.S.C. 112 for one or more claims of this application. The applications fail to disclose SEQ ID No. 3, 24, or 25, therefore there does not appear to be support for the applicant's presently claimed invention in these provisional applications. As a result the earliest filing date of record is deemed to be 4/16/2004.

Response to Arguments

The reply did not traverse the denial of priority to the prior-filed applications, Application No. 60/469294, 60/465428, 60/464049. Therefore the filing date of record is being maintained as 4/16/2004.

Withdrawn Objections and Rejections

7. The objection to Claims 124-125 made in section 8 of the previous office action is moot based on the amendments of the claims.

8. The rejection of the claims under 35 USC 112/New Matter made in section 9 of the previous office action is moot based upon the cancellation of the claims.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

9. Claims 116, 124-130 are rejected under 35 U.S.C. 102(e) as being anticipated by Peiris et al. (US Patent Application Publication 2005/0009009 A1 January 13, 2005).

Peiris et al. teaches the use of oligonucleotides for a diagnostic assay for detecting SARS.

With regard to Claims 116, 124, 125-126, Peiris et al. teaches a methodology to produce oligonucleotides to detect the SARS virus. Peiris et al. teaches primers for use in amplifying the mRNA or genomic RNA of the SARS virus is based on known synthesizing methods (p. 7 paragraph 58). Peiris et al. teaches the exact length of primer will depend on the temperature, buffer, and nucleotide composition (p. 7 paragraph 58). Peiris et al. teaches the primer must prime the synthesis of extension products in the presence of the inducing agent for amplification (p. 7 paragraph 58).

Peiris et al. teaches primers and probes for polynucleotides of the SARS virus can be developed using known methods (p. 7 paragraph 59). Peiris et al. teaches primers are preferred to be as close as possible to the probe without overlapping the probe (p. 7 paragraph 59). Peiris et al. teaches the G-C content of the primers should be in the 20% to 80% range (p. 7 paragraph 59). Peiris et al. teaches it is preferred to avoid runs of an identical nucleotides especially guanine (p. 7 paragraph 59). Peiris et

al. teaches the preferred melting temperature of each primer is 58 to 60 (p. 7 paragraph 59). Peiris et al. teaches the five nucleotides at the 3' end of each primer is preferred to not have more than two G or C bases (p. 7 paragraph 59). Peiris et al. teaches probes can be designed using software such as Primer Express (p. 7 paragraph 60). Peiris et al. teaches it is preferable to keep the G-C content in the 20%-80% range and to avoid runs of an identical nucleotide (p. 7 paragraph 60).

Peiris et al. teaches the size of the primers used to amplify a portion of the mRNA is at least 10, 15, 20, 25, or 30 nucleotides in length (p. 7 paragraph 62).

Peiris et al. teaches that besides the SARS virus there are two known serogroups of human cornoviruses (229E and OC43) (p. 27 paragraph 251). Peiris et al. teaches the primer sets used in the present assay do not have homology to either of the strains so therefore they do not cross-react with the strains (p. 27 paragraph 251). Therefore these primer sets include "its complement" or "DNA equivalents" of SEQ ID NO. 3. Further, Peiris et al. teaches the sequence analyses of the available sequences in regions of the OC43 polymerase gene indicate the SARS virus is genetically distinct from OC43 (p. 27 paragraph 251).

With regard to Claims 27-29, Peiris et al. teaches using nucleotides in a RT-PCR to detect SAS virus (Abstract). Peiris et al. teaches making primers and probes based on the genomic sequence of hSARS virus to use in TaqMan assays (Abstract). With regard to Claims 27-29, Peiris et al. teaches the probe is a Taqman probe, which consists of an oligonucleotide with a 5'reporter (luminescent) dye and a 3' quencher

dye (a pair of interacting labels consisting of a luminescent and a quencher in which the probe is detectably labeled) (p. 6 paragraph 54).

With regard to Claim 130, Peiris et al. teaches using hybridization conditions which are stringent conditions and include a temperature ranging from 50°C to 65°C (this range includes 60°C) (p. 3 paragraph 26).

Response to arguments

The reply traverses the rejection. A summary of the arguments presented in the reply is provided below with response to arguments following.

The reply asserts that the interpretation of a base sequence selected from the group consisting of SEQ ID NO. 2, its complement, and the DNA equivalents thereof to include any base sequence having at least one nucleotide in common with SEQ ID No. 3, its complement, and the DNA equivalents therefor ignores the requirement that the base sequence consists of or is contained within and includes at least 18 contiguous bases (p. 6 3rd paragraph). The reply asserts that that the phrase "the DNA equivalents thereof" is referring to a structural equivalences and not a functional equivalence (p. 6 last paragraph). The reply asserts that therefore there is no basis for concluding that the claims cover any sequence for detecting SARS-CoV (p. 7 1st paragraph).

These arguments have been fully reviewed but have not been found persuasive.

The terms "its complement" and "DNA equivalents" are broad terms and the instant specification provides no explicit definition of either term. Therefore the term "its complement" can refer to any fragment that has at least one base pair in complement to

SEQ ID No. 3. The term DNA equivalent can refer to any fragment that has at least one DNA nucleotide in common with SEQ ID No. 3 (e.g. an A, G, or C). Though the base sequence is limited to having at least 18 contiguous sequences of "its complement" or "DNA equivalents", these 18 nucleotides are not required to be identical to SEQ ID No. 3, but merely encompass at least one nucleotide in complement or at least one nucleotide that is the DNA equivalent. Peiris et al. teaches the size of the primers used to amplify a portion of the mRNA is at least 20, 25, or 30 nucleotides in length (p. 7 paragraph 62). Therefore these primers would include at least 18 contiguous bases of a base sequence selected from the group consisting of its complement and the DNA equivalents thereof. It is suggested by the examiner that the term "its complement" be amended to "the complement of SEQ ID NO. 3" if applicant would want to limit the base sequence to at least 18 contiguous bases of the complement of SEQ ID no. 3.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

11. Claims 116, 124-130 are rejected under 35 U.S.C. 103(a) as being unpatentable over GenBank Accession Number NC_004718.1 (NCBI GenBank Accession Number April 14, 2003) in view of Peiris et al. (US Patent Application Publication 2005/0009009 A1 January 13, 2005).

GenBank Accession Number NC_004718 (April 14, 2003) discloses the complete genomic sequence of the SARS coronavirus. With regard to Claims 116, 124-125, NC_004718 discloses a sequence in which SEQ ID No. 3 is contained within. SEQ ID No. 3 is identical to nucleotides 18162-18206. Therefore, NC_004718 discloses a sequence, which comprises the SEQ ID in the claimed invention.

NC_004718, however, does not teach the specific fragments of SEQ ID No 3.

Peiris et al. teaches the use of oligonucleotides for a diagnostic assay for detecting SARS.

With regard to Claims 116, 124-125, Peiris et al. teaches a methodology to produce oligonucleotides to detect the SARS virus. Peiris et al. teaches primers for use in amplifying the mRNA or genomic RNA of the SARS virus is based on known synthesizing methods (p. 7 paragraph 58). Peiris et al. teaches the exact length of primer will depend on the temperature, buffer, and nucleotide composition (p. 7 paragraph 58). Peiris et al. teaches the primer must prime the synthesis of extension products in the presence of the inducing agent for amplification (p. 7 paragraph 58).

Peiris et al. teaches primers and probes for polynucleotides of the SARS virus can be developed using known methods (p. 7 paragraph 59). Peiris et al. teaches primers are preferred to be as close as possible to the probe without overlapping the probe (p. 7 paragraph 59). Peiris et al. teaches the G-C content of the primers should be in the 20% to 80% range (p. 7 paragraph 59). Peiris et al. teaches it is preferred to avoid runs of an identical nucleotides especially guanine (p. 7 paragraph 59). Peiris et al. teaches the preferred melting temperature of each primer is 58 to 60 (p. 7 paragraph 59). . Peiris et al. teaches the five nucleotides at the 3' end of each primer is preferred to not have more than two G or C bases (p. 7 paragraph 59). Peiris et al. teaches probes can be designed using software such as Primer Express (p. 7 paragraph 60). Peiris et al. teaches it is preferable to keep the G-C content in the 20%-80% range and to avoid runs of an identical nucleotide (p. 7 paragraph 60).

Peiris et al. teaches the size of the primers used to amplify a portion of the mRNA is at least 10, 15, 20, 25, or 30 nucleotides in length (p. 7 paragraph 62).

Peiris et al. teaches that besides the SARS virus there are two known serogroups of human cornoviruses (229E and OC43) (p. 27 paragraph 251). Peiris et al. teaches the primer sets used in the present assay do not have homology to either of the strains so therefore they do not cross-react with the strains (p. 27 paragraph 251). Further, Peiris et al. teaches the sequence analyses of the available sequences in regions of the OC43 polymerase gene indicate the SARS virus is genetically distinct from OC43 (p. 27 paragraph 251).

Peiris et al. teaches using nucleotides in a RT-PCR to detect SARS virus (Abstract). Peiris et al. teaches making primers and probes based on the genomic sequence of hSARS virus to use in TaqMan assays (Abstract).

With regard to Claims 127-129, Peiris et al. teaches the probe is a Taqman probe, which consists of an oligonucleotide with a 5'reporter (luminescent) dye and a 3' quencher dye (a pair of interacting labels consisting of a luminescent and a quencher in which the probe is detectably labeled) (p. 6 paragraph 54).

With regard to Claim 130, Peiris et al. teaches using hybridization conditions which are stringent conditions and include a temperature ranging from 50°C to 65°C (this range includes 60°C) (p. 3 paragraph 26).

Therefore, the ordinary artisan would have been motivated to select any number of oligonucleotides including SEQ ID No. 3 for amplifying and detecting the SARS virus. The art of designing probes and primers at the time the invention was made was very well described in the art. The art uses alignment programs to align sequences of interest and then uses algorithms to select and test probes and primers for their desired

function of either detecting or distinguishing particular organisms. Designing primers and probes, which are equivalents to those taught in the art, is routine experimentation. The prior art is replete with guidance and information necessary to permit the ordinary artisan in the field of nucleic acid detection to design primers and probes. The claimed primers are prima facie obvious over the cited references in the absence of secondary considerations, given the extensive teachings in the art. It would have been prima facie obvious to one of ordinary skill in the art at the time the claimed invention was made to use the SARS sequence as disclosed by NC_004718 to create new oligonucleotides to detect the SARS virus using the guidance of the design constraints as taught by Peiris et al. to obtain equivalent alternative oligonucleotides of the claimed invention such as SEQ ID No. 3. The ordinary artisan would be motivated to have designed and tested new oligonucleotides from fragments of NC_004718 to obtain additional oligonucleotides that function to detect the SARS virus and identify oligonucleotides with improved properties.

Response to arguments

The reply traverses the rejection. A summary of the arguments presented in the reply is provided below with response to arguments following.

The reply asserts that the applicant has demonstrated that probes targeting at least 18 base regions contained within a sequence corresponding to SEQ ID No. 3 function well at detecting nucleic acid derived from SARS coronavirus, while overlapping probes that were tested did not (p. 7 last paragraph). The reply asserts that

18 contiguous bases of SEQ ID No. 3 is nearly 80% of SEQ ID No. 3 and therefore there is a large fragment of SEQ ID NO. 3 required by the claims (p. 8 1st paragraph). The reply asserts that the Examples provided by Example 1 and 2 show that sequences with at least 18 contiguous bases detected the SARS virus well (p. 8 1st paragraph). The reply asserts that the detection probes that only share 5 contiguous bases in common with SEQ ID No. 3 did not perform well at detection (p. 8 2nd paragraph). The reply asserts that the claimed probes have superior detection properties that were not expected (p. 8 2nd paragraph).

These arguments have been fully reviewed but have not been found persuasive.

The reply is asserting that the claims are limited to base sequences which have 18 contiguous bases of SEQ ID No. 3, however, the terms "its complement" and "DNA equivalents" broaden the scope of the claims to base sequences with at least 18 contiguous bases in length and have at least one nucleotide in complement with SEQ ID No. 3 or one nucleotide of DNA equivalent of SEQ ID No. 3. The terms "its complement" and "DNA equivalents" are broad terms and the instant specification provides no explicit definition of either term. Therefore the term "its complement" can refer to any fragment that has at least one base pair in complement to SEQ ID No. 3. The term DNA equivalent can refer to any fragment that has at least one DNA nucleotide in common with SEQ ID No. 3 (e.g. an A, G, or C). Further the term "DNA equalivalent" does not limit the structure to DNA, but to fragments that have at least one DNA nucleotide. Though the base sequence is limited to having at least 18 contiguous sequences of "its complement" or "DNA equivalents", these 18 nucleotides are not

required to be identical to SEQ ID No. 3, but merely encompass at least one nucleotide in complement or at least one nucleotide that is the DNA equivalent. Peiris et al. teaches the size of the primers used to amplify a portion of the mRNA is at least 20, 25, or 30 nucleotides in length (p. 7 paragraph 62). Therefore these primers would include at least 18 contiguous bases of a base sequence selected from the group consisting of its complement and the DNA equivalents thereof. It is suggested by the examiner that the term "its complement" be amended to "the complement of SEQ ID NO. 3" if applicant would want to limit the base sequence to at least 18 contiguous bases of the complement of SEQ ID no. 3. As to the claim requiring 80% of SEQ ID No. 3, this has bee reviewed but has not been found persuasive. The phrases "DNA equivalents" and "its complement" broaden to the scope of the claim such that only one nucleotide in common with SEQ ID No. 3 would be required. Further, the applicant argues that probes with at least 18 contiguous bases of SEQ ID No. 3 have the unexpected result of detecting the SARS virus compared to sequences which do not share at least 18 contiguous bases to SEQ ID No. 3. However, as discussed above the claimed probe is broader than the examples of probes with at least 18 contiguous bases. Further, the examples in the instant specification do not disclose that probes which do not share at least 18 contiguous bases would not work but rather require further optimization. The instant specification teaches with regard to SEQ ID No. 44 and 45 "it is possible that these molecular beacon probes could detectably hybridize to target amplicon derived from the transcript in an optimized assay" p. 58 lines 5-10.

Therefore there is indication that by routine optimization these probes could be used to detect the SARS virus.

Therefore, the applicant has not provided evidence via secondary consideration that the probes made by the suggestion and teachings of the prior art would not be equivalent structures as the claimed probes. This should not be construed as an invitation for providing evidence. As further stated in the MPEP 716.01 regarding the timely submission of evidence:

A) Timeliness.
Evidence traversing rejections must be timely or seasonably filed to be entered and entitled to consideration. In re Rothermel, 276 F.2d 393, 125 USPQ 328 (CCPA 1960). Affidavits and declarations submitted under 37 CFR 1.132 and other evidence traversing rejections are considered timely if submitted:
(1) prior to a final rejection,
(2) before appeal in an application not having a final rejection, or
(3) after final rejection and submitted
(i) with a first reply after final rejection for the purpose of overcoming a new ground of rejection or requirement made in the final rejection, or
(ii) with a satisfactory showing under 37 CFR 1.116(b) or 37 CFR 1.195, or
(iii) under 37 CFR 1.129(a).

Conclusion

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Katherine Salmon whose telephone number is (571) 272-3316. The examiner can normally be reached on Monday-Friday 8AM-430PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ram Shukla can be reached on (571) 272-0735. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Katherine Salmon/
Examiner, Art Unit 1634

/Ram R. Shukla/

Supervisory Patent Examiner, Art Unit 1634